CHAPTER 45-04-12 VALUATION OF LIFE INSURANCE POLICIES

Section	
45-04-12-01	Applicability
45-04-12-02	Definitions
45-04-12-03	General Calculation Requirements for Basic Reserves and
	Premium Deficiency Reserves
45-04-12-04	Calculation of Minimum Valuation Standard for Policies With
	Guaranteed Nonlevel Gross Premiums or Guaranteed
	Nonlevel Benefits, Other Than Universal Life Policies
45-04-12-05	Calculation of Minimum Valuation Standard for Flexible
	Premium and Fixed Premium Universal Life Insurance
	Policies That Contain Provisions Resulting in the Ability
	of a Policy Owner to Keep a Policy in Force Over a
	Secondary Guarantee Period

45-04-12-01. Applicability. This chapter shall apply to all life insurance policies, with or without nonforfeiture values, issued on or after January 1, 2000, subject to the following exceptions and conditions:

1. Exceptions.

- a. This chapter shall not apply to any individual life insurance policy issued on or after January 1, 2000, if the policy is issued in accordance with and as a result of the exercise of a reentry provision contained in the original life insurance policy of the same or greater face amount issued before January 1, 2000, which guarantees the premium rates of the new policy. This chapter also shall not apply to subsequent policies issued as a result of the exercise of such a provision, or a derivation of the provision, in the new policy.
- b. This chapter shall not apply to any universal life policy that meets all the following requirements:
 - (1) Secondary guarantee period, if any, is five years or less;
 - (2) Specified premium for the secondary guarantee period is not less than the net level reserve premium for the secondary guarantee period based on the CSO valuation tables as defined in subsection 6 of section 45-04-12-02 and the applicable valuation interest rate; and
 - (3) The initial surrender charge is not less than one hundred percent of the first year annualized specified premium for the secondary guarantee period.

- C. This chapter shall not apply to any variable life insurance policy that provides for life insurance, the amount or duration of which varies according to the investment experience of any separate account or accounts.
- d. This chapter shall not apply to any variable universal life insurance policy that provides for life insurance, the amount or duration of which varies according to the investment experience of any separate account or accounts.
- e. This chapter shall not apply to a group life insurance certificate unless the certificate provides for a stated or implied schedule of maximum gross premiums required in order to continue coverage in force for a period in excess of one year.

2. Conditions.

- a. Calculation of the minimum valuation standard for policies with guaranteed nonlevel gross premiums or guaranteed nonlevel benefits, other than universal life policies, or both, shall be in accordance with the provisions of section 45-04-12-04.
- b. Calculation of the minimum valuation standard for flexible premium and fixed premium universal life insurance policies, that contain provisions resulting in the ability of a policyholder to keep a policy in force over a secondary guarantee period, shall be in accordance with the provisions of section 45-04-12-05.

History: Effective January 1, 2000. General Authority: NDCC 28-32-02 Law Implemented: NDCC 26.1-35

45-04-12-02. Definitions. For purposes of this chapter:

- 1. "Basic reserves" means reserves calculated in accordance with North Dakota Century Code section 26.1-35-05.
- 2. "Contract segmentation method" means the method of dividing the period from issue to mandatory expiration of a policy into successive segments, with the length of each segment being defined as the period from the end of the prior segment, from policy inception for the first segment, to the end of the latest policy year as determined below. All calculations are made using the 1980 CSO valuation tables or any other valuation mortality table adopted by the national association of insurance commissioners after January 1, 2000, and promulgated by rule by the commissioner for this purpose, and, if elected, the optional minimum mortality standard for deficiency reserves stipulated in subsection 2 of section 45-04-12-03.

The length of a particular contract segment shall be set equal to the minimum of the value t for which G_t is greater than R_t , if G_t never exceeds R_t the segment length is deemed to be the number of years from the beginning of the segment to the mandatory expiration date of the policy, where G_t and R_t are defined as follows:

$$G_{t} = \frac{GP_{x+k+t}}{GP_{x+k+t-1}}$$

where:

x = original issue age;

k = the number of years from the date of issue to the beginning of the segment;

t = 1, 2, ...; t is reset to 1 at the beginning of each
 segment; and

 $\operatorname{GP}_{x+k+t-1}$ = Guaranteed gross premium per thousand of face amount for year t of the segment, ignoring policy fees only if level for the premium paying period of the policy.

$$\mathbf{R_{t}} = \underbrace{\begin{array}{c} \mathbf{q_{x+k+t}} \\ \mathbf{q_{x+k+t-1}} \end{array}}_{\mathbf{q_{x+k+t-1}}}, \text{ however, } \mathbf{R_{t}} \text{ may be increased} \\ \text{ or decreased by one percent in any policy year, at the company's option, but } \mathbf{R_{t}} \text{ shall not be less than one;}$$

where:

x, k, and t are as defined above, and

 $\mathbf{q}_{\mathbf{x}+\mathbf{k}+\mathbf{t}-\mathbf{l}=}$ Valuation mortality rate for deficiency reserves in policy year k+t but using the mortality of subdivision b of subsection 2 of section 45-04-12-03 if subdivision c of subsection 2 of section 45-04-12-03 is elected for deficiency reserves.

However, if GP_{x+k+t} is greater than 0 and $GP_{x+k+t-1}$ is equal to 0, G_t shall be deemed to be 1000. If GP_{x+k+t} and $GP_{x+k+t-1}$ are both equal to 0, G_t shall be deemed to be 0.

- 3. "Deficiency reserves" means the excess, if greater than zero, of:
 - Minimum reserves calculated in accordance with North Dakota Century Code section 26.1-35-09.
 - b. Basic reserves.
- "Guaranteed gross premiums" means the premiums under a policy of life insurance that are guaranteed and determined at issue.

- 5. "Maximum valuation interest rates" means the interest rates defined in North Dakota Century Code section 26.1-35-04, computation of minimum standard by calendar year of issue, which are to be used in determining the minimum standard for the valuation of life insurance policies.
- 6. "1980 CSO valuation tables" means the commissioners' 1980 standard ordinary mortality table (1980 CSO table) without ten-year selection factors, incorporated into the 1980 amendments to the national association of insurance commissioners standard valuation law, and variations of the 1980 CSO table approved by the national association of insurance commissioners, such as the smoker and nonsmoker versions approved in December 1983.
- 7. "Scheduled gross premium" means the smallest illustrated gross premium at issue for other than universal life insurance policies. For universal life insurance policies, scheduled gross premium means the smallest specified premium described in subdivision c of subsection 1 of section 45-04-12-05, if any, or else the minimum premium described in subdivision d of subsection 1 of section 45-04-12-05.
 - 8. a. "Segmented reserves" means reserves, calculated using segments produced by the contract segmentation method, equal to the present value of all future guaranteed benefits less the present value of all future net premiums to the mandatory expiration of a policy, when the net premiums within each segment are a uniform percentage of the respective guaranteed gross premiums within the segment. The uniform percentage for each segment is such that, at the beginning of the segment, the present value of the net premiums within the segment equals:
 - (1) The present value of the death benefits within the segment; plus
 - (2) The present value of any unusual guaranteed cash value (see subsection 4 of section 45-04-12-04) occurring at the end of the segment; less
 - (3) Any unusual guaranteed cash value occurring at the start of the segment; plus
 - (4) For the first segment only, the excess of subparagraph a over subparagraph b, as follows:
 - (a) A net level annual premium equal to the present value, at the date of issue, of the benefits provided for in the first segment after the first policy year, divided by the present value, at the date of issue, of an annuity of one per year payable on the first and each

subsequent anniversary within the first segment on which a premium falls due. However, the net level annual premium shall not exceed the net level annual premium on the nineteen-year premium whole life plan of insurance of the same renewal year equivalent level amount at an age one year higher than the age at issue of the policy.

- (b) A net one-year term premium for the benefits provided for in the first policy year.
- b. The length of each segment is determined by the contract segmentation method, as defined in this section.
- C. The interest rates used in the present value calculations for any policy may not exceed the maximum valuation interest rate, determined with a guarantee duration equal to the sum of the lengths of all segments of the policy.
- d. For both basic reserves and deficiency reserves computed by the segmented method, present values shall include future benefits and net premiums in the current segment and in all subsequent segments.
- 9. "Tabular cost of insurance" means the net single premium at the beginning of a policy year for one-year term insurance in the amount of the guaranteed death benefit in that policy year.
- 10. "Ten-year select factors" means the select factors adopted with the 1980 amendments to the national association of insurance commissioners standard valuation law.
 - 11. a. "Unitary reserves" means the present value of all future guaranteed benefits less the present value of all future modified net premiums, when:
 - (1) Guaranteed benefits and modified net premiums are considered to the mandatory expiration of the policy; and
 - (2) Modified net premiums are a uniform percentage of the respective guaranteed gross premiums, when the uniform percentage is such that, at issue, the present value of the net premiums equals the present value of all death benefits and pure endowments, plus the excess of subparagraph a over subparagraph b, as follows:
 - (a) A net level annual premium equal to the present value, at the date of issue, of the benefits provided for after the first policy year, divided by the present value, at the

date of issue, of an annuity of one per year payable on the first and each subsequent anniversary of the policy on which a premium falls due. However, the net level annual premium shall not exceed the net level annual premium on the nineteen-year premium whole life plan of insurance of the same renewal year equivalent level amount at an age one year higher than the age at issue of the policy.

- (b) A net one-year term premium for the benefits provided for in the first policy year.
- b. The interest rates used in the present value calculations for any policy may not exceed the maximum valuation interest rate, determined with a guarantee duration equal to the length from issue to the mandatory expiration of the policy.
- 12. "Universal life insurance policy" means any individual life insurance policy under the provisions of which separately identified interest credits, other than in connection with dividend accumulations, premium deposit funds, or other supplementary accounts, and mortality or expense charges are made to the policy.

History: Effective January 1, 2000. General Authority: NDCC 28-32-02 Law Implemented: NDCC 26.1-35

45-04-12-03. General calculation requirements for basic reserves and premium deficiency reserves.

- 1. At the election of the company for any one or more specified plans of life insurance, the minimum mortality standard for basic reserves may be calculated using the 1980 CSO valuation tables with select mortality factors, or any other valuation mortality table adopted by the national association of insurance commissioners after January 1, 2000, and promulgated by rule by the commissioner for this purpose. If select mortality factors are elected, they may be:
 - a. The ten-year select mortality factors incorporated into the 1980 amendments to the national association of insurance commissioners standard valuation law;
 - b. The select mortality factors in the appendix; or
 - C. Any other table of select mortality factors adopted by the national association of insurance commissioners after January 1, 2000, and promulgated by rule by the commissioner for the purpose of calculating basic reserves.

- 2. Deficiency reserves, if any, are calculated for each policy as the excess, if greater than zero, of the quantity A over the basic reserve. The quantity A is obtained by recalculating the basic reserve for the policy using guaranteed gross premiums instead of net premiums when the guaranteed gross premiums are less than the corresponding net premiums. At the election of the company for any one or more specified plans of insurance, the quantity A and the corresponding net premiums used in the determination of quantity A may be based upon the 1980 CSO valuation tables with select mortality factors, or any other valuation mortality table adopted by the national association of insurance commissioners after January 1, 2000, and promulgated by rule by the commissioner. If select mortality factors are elected, they may be:
 - a. The ten-year select mortality factors incorporated into the 1980 amendments to the national association of insurance commissioners standard valuation law:
 - b. The select mortality factors in the appendix of this chapter;
 - For durations in the first segment, X percent of the select mortality factors in the appendix, subject to the following:
 - X may vary by policy year, policy form, underwriting classification, issue age, or any other policy factor expected to affect mortality experience;
 - (2) X shall not be less than twenty percent;
 - (3) X shall not decrease in any successive policy years;
 - (4) X is such that, when using the valuation interest rate used for basic reserves, subparagraph a is greater than or equal to subparagraph b:
 - (a) The actuarial present value of future death benefits, calculated using the mortality rates resulting from the application of X;
 - (b) The actuarial present value of future death benefits calculated using anticipated mortality experience without recognition of mortality improvement beyond the valuation date:
 - (5) X is such that the mortality rates resulting from the application of X are at least as great as the anticipated mortality experience, without recognition of mortality improvement beyond the valuation date, in each of the first five years after the valuation date;

- (6) The appointed actuary shall increase X at any valuation date when it is necessary to continue to meet all the requirements of subdivision c of subsection 2:
- (7) The appointed actuary may decrease X at any valuation date as long as X does not decrease in any successive policy years and as long as it continues to meet all the requirements of subdivision c of subsection 2;
- (8) The appointed actuary shall specifically take into account the adverse effect on expected mortality and lapsation of any anticipated or actual increase in gross premiums; and
- (9) If X is less than one hundred percent at any duration for any policy, the following requirements shall be met:
 - (a) The appointed actuary shall annually prepare an actuarial opinion and memorandum for the company in conformance with the requirements of chapter 45-03-19; and
 - (b) The appointed actuary shall annually opine for all policies subject to this rule as to whether the mortality rates resulting from the application of X meet the requirements of subdivision c of subsection 2. This opinion shall be supported by an actuarial report, subject to appropriate actuarial standards of practice promulgated by the actuarial standards board of the American academy of actuaries. The X factors shall reflect anticipated future mortality, without recognition of mortality improvement beyond the valuation date, taking into account relevant emerging experience.
- d. Any other table of select mortality factors adopted by the national association of insurance commissioners after January 1, 2000, and promulgated by rule by the commissioner for the purpose of calculating deficiency reserves.
- 3. This subsection applies to both basic reserves and deficiency reserves. Any set of select mortality factors may be used only for the first segment. However, if the first segment is less than ten years, the appropriate ten-year select mortality factors incorporated into the 1980 amendments to the national association of insurance commissioners standard valuation law may be used thereafter through the tenth policy year from the date of issue.
- In determining basic reserves or deficiency reserves, guaranteed gross premiums without policy fees may be used when the calculation involves the guaranteed gross premium but only if the policy fee is a level dollar

amount after the first policy year. In determining deficiency reserves, policy fees may be included in guaranteed gross premiums, even if not included in the actual calculation of basic reserves.

- 5. Reserves for policies that have changes to guaranteed gross premiums, guaranteed benefits, guaranteed charges, or guaranteed credits that are unilaterally made by the insurer after issue and that are effective for more than one year after the date of the change shall be the greatest of the following:
 - a. Reserves calculated ignoring the guarantee;
 - b. Reserves assuming the guarantee was made at issue; and
 - C. Reserves assuming that the policy was issued on the date of the guarantee.
- 6. The commissioner may require that the company document the extent of the adequacy of reserves for specified blocks, including policies issued prior to January 1, 2000. This documentation may include a demonstration of the extent to which aggregation with other nonspecified blocks of business is relied upon in the formation of the appointed actuary opinion pursuant to and consistent with the requirements of chapter 45-03-19.

History: Effective January 1, 2000. General Authority: NDCC 28-32-02 Law Implemented: NDCC 26.1-35

45-04-12-04. Calculation of minimum valuation standard for policies with guaranteed nonlevel gross premiums or guaranteed nonlevel benefits, other than universal life policies.

- 1. Basic reserves. Basic reserves shall be calculated as the greater of the segmented reserves and the unitary reserves. Both the segmented reserves and the unitary reserves for any policy shall use the same valuation mortality table and selection factors. At the option of the insurer, in calculating segmented reserves and net premiums, either of the adjustments described in subdivision a or b may be made:
 - a. Treat the unitary reserve, if greater than zero, applicable at the end of each segment as a pure endowment and subtract the unitary reserve, if greater than zero, applicable at the beginning of each segment from the present value of guaranteed life insurance and endowment benefits for each segment.
 - Treat the guaranteed cash surrender value, if greater than zero, applicable at the end of each segment as a pure endowment and subtract the guaranteed cash surrender value, if greater than zero,

applicable at the beginning of each segment from the present value of guaranteed life insurance and endowment benefits for each segment.

2. Deficiency reserves.

- a. The deficiency reserve at any duration shall be calculated:
 - (1) On a unitary basis if the corresponding basic reserve determined by subsection 1 is unitary;
 - (2) On a segmented basis if the corresponding basic reserve determined by subsection 1 is segmented; or
 - (3) On the segmented basis if the corresponding basic reserve determined by subsection 1 is equal to both the segmented reserve and the unitary reserve.
- b. This subsection shall apply to any policy for which the guaranteed gross premium at any duration is less than the corresponding modified net premium calculated by the method used in determining the basic reserves, but using the minimum valuation standards of mortality, specified in subsection 2 of section 45-04-12-03, and rate of interest.
- C. Deficiency reserves, if any, shall be calculated for each policy as the excess if greater than zero, for the current and all remaining periods, of the quantity A over the basic reserve, where A is obtained as indicated in subsection 2 of section 45-04-12-03.
- d. For deficiency reserves determined on a segmented basis, the quantity A is determined using segment lengths equal to those determined for segmented basic reserves.
- 3. Minimum value. Basic reserves may not be less than the tabular cost of insurance for the balance of the policy year if mean reserves are used. Basic reserves may not be less than the tabular cost of insurance for the balance of the current modal period or to the paid-to date, if later, but not beyond the next policy anniversary, if midterminal reserves are used. The tabular cost of insurance shall use the same valuation mortality table and interest rates as that used for the calculation of the segmented reserves. However, if select mortality factors are used, they shall be the ten-year select factors incorporated into the 1980 amendments of the national association of insurance commissioners standard valuation law. In no case may total reserves, including basic reserves, deficiency reserves, and any reserves held for supplemental benefits that would expire upon contract termination, be less than the amount that the policy owner would receive, including the cash surrender value of the supplemental benefits, if any, referred to above,

exclusive of any deduction for policy loans, upon termination of the policy.

- 4. Unusual pattern of guaranteed cash surrender values.
 - For any policy with an unusual pattern of guaranteed cash surrender values, the reserves actually held prior to the first unusual guaranteed cash surrender value shall not be less than the reserves calculated by treating the first unusual guaranteed cash surrender value as a pure endowment and treating the policy as an n-year policy providing term insurance plus a pure endowment equal to the unusual cash surrender value, when n is the number of years from the date of issue to the date the unusual cash surrender value is scheduled.
 - b. The reserves actually held subsequent to any unusual guaranteed cash surrender value shall not be less than the reserves calculated by treating the policy as an n-year policy providing term insurance plus a pure endowment equal to the next unusual guaranteed cash surrender value, and treating any unusual guaranteed cash surrender value at the end of the prior segment as a net single premium, when:
 - (1) n is the number of years from the date of the last unusual guaranteed cash surrender value prior to the valuation date to the earlier of:
 - (a) The date of the next unusual guaranteed cash surrender value, if any, that is scheduled after the valuation date; or
 - (b) The mandatory expiration date of the policy;
 - (2) The net premium for a given year during the n-year period is equal to the product of the net to gross ratio and the respective gross premium; and
 - (3) The net to gross ratio is equal to subparagraph a divided by subparagraph b as follows:
 - (a) The present value, at the beginning of the n year period, of death benefits payable during the n-year period plus the present value, at the beginning of the n-year period, of the next unusual guaranteed cash surrender value, if any, minus the amount of the last unusual guaranteed cash surrender value, if any, scheduled at the beginning of the n-year period.

- (b) The present value, at the beginning of the n-year period, of the scheduled gross premiums payable during the n-year period.
- c. For purposes of this subsection, a policy is considered to have an unusual pattern of guaranteed cash surrender values if any future guaranteed cash surrender value exceeds the prior year's guaranteed cash surrender value by more than the sum of:
 - (1) One hundred ten percent of the scheduled gross premium for that year;
 - (2) One hundred ten percent of one year's accrued interest on the sum of the prior year's guaranteed cash surrender value and the scheduled gross premium using the nonforfeiture interest rate used for calculating policy guaranteed cash surrender values; and
 - (3) Five percent of the first policy year surrender charge, if any.
- 5. Optional exemption for yearly renewable term reinsurance. At the option of the company, the following approach for reserves on yearly renewable term reinsurance may be used:
 - a. Calculate the valuation net premium for each future policy year as the tabular cost of insurance for that future year.
 - b. Basic reserves shall never be less than the tabular cost of insurance for the appropriate period, as determined under subsection 3.
 - c. Deficiency reserves.
 - (1) For each policy year, calculate the excess, if greater than zero, of the valuation net premium over the respective maximum guaranteed gross premium.
 - (2) Deficiency reserves shall never be less than the sum of the present values, at the date of valuation, of the excesses determined in accordance with paragraph 1.
 - d. For purposes of this subsection, the calculations use the maximum valuation interest rate and the 1980 CSO mortality tables with or without ten-year select mortality factors, or any other table adopted after January 1, 2000, by the national association of insurance commissioners and promulgated by rule by the commissioner for this purpose.

- e. A reinsurance agreement shall be considered yearly renewable term reinsurance for purposes of this subsection if only the mortality risk is reinsured.
- f. If the assuming company chooses this optional exemption, the ceding company's reinsurance reserve credit shall be limited to the amount of reserve held by the assuming company for the affected policies.
- 6. Optional exemption for attained-age-based yearly renewable term life insurance policies. At the option of the company, the following approach for reserves for attained-age-based yearly renewable term life insurance policies may be used:
 - a. Calculate the valuation net premium for each future policy year as the tabular cost of insurance for that future year.
 - Basic reserves shall never be less than the tabular cost of insurance for the appropriate period, as defined in paragraph 3 of subdivision f.
 - c. Deficiency reserves.
 - (1) For each policy year, calculate the excess, if greater than zero, of the valuation net premium over the respective maximum guaranteed gross premium.
 - (2) Deficiency reserves shall never be less than the sum of the present values, at the date of valuation, of the excesses determined in accordance with paragraph 1.
 - d. For purposes of this subsection, the calculations use the maximum valuation interest rate and the 1980 CSO valuation tables with or without ten-year select mortality factors, or any other table adopted after Janaury 1, 2000, by the national association of insurance commissioners and promulgated by rule by the commissioner for this purpose.
 - e. A policy shall be considered an attained-age-based yearly renewable term life insurance policy for purposes of this subsection if:
 - (1) The premium rates, on both the initial current premium scale and the guaranteed maximum premium scale, are based upon the attained age of the insured such that the rate for any given policy at a given attained age of the insured is independent of the year the policy was issued; and

- (2) The premium rates, on both the initial current premium scale and the guaranteed maximum premium scale, are the same as the premium rates for policies covering all insureds of the same sex, risk class, plan of insurance, and attained age.
- f. For policies that become attained-age-based yearly renewable term policies after an initial period of coverage, the approach of this subsection may be used after the initial period if:
 - (1) The initial period is constant for all insureds of the same sex, risk class, and plan of insurance; or
 - (2) The initial period runs to a common attained age for all insureds of the same sex, risk class, and plan of insurance; and
 - (3) After the initial period of coverage, the policy meets the conditions of subdivision e.
- 9. If this election is made, this approach shall be applied in determining reserves for all attained-age-based yearly renewable term life insurance policies issued on or after January 1, 2000.
- 7. Exemption from unitary reserves for certain n-year renewable term life insurance policies. Unitary basic reserves and unitary deficiency reserves need not be calculated for a policy if the following conditions are met:
 - a. The policy consists of a series of n-year periods, including the first period and all renewal periods, where n is the same for each period, except that for the final renewal period, n may be truncated or extended to reach the expiry age, provided that this final renewal period is less than ten years and less than twice the size of the earlier n-year periods, and for each period, the premium rates on both the initial current premium scale and the guaranteed maximum premium scale are level:
 - The guaranteed gross premiums in all n-year periods are not less than the corresponding net premiums based upon the 1980 CSO valuation table with or without the ten-year select mortality factors; and
 - c. There are no cash surrender values in any policy year.
- 8. Exemption from unitary reserves for certain juvenile policies. Unitary basic reserves and unitary deficiency reserves need not be calculated for a policy if the following conditions are met, based upon the initial current premium scale at issue:

- a. At issue, the insured is age twenty-four or younger;
- b. Until the insured reaches the end of the juvenile period, which shall occur at or before age twenty-five, the gross premiums and death benefits are level, and there are no cash surrender values; and
- C. After the end of the juvenile period, gross premiums are level for the remainder of the premium paying period, and death benefits are level for the remainder of the life of the policy.

History: Effective January 1, 2000. General Authority: NDCC 28-32-02 Law Implemented: NDCC 26.1-35

45-04-12-05. Calculation of minimum valuation standard for flexible premium and fixed premium universal life insurance policies that contain provisions resulting in the ability of a policy owner to keep a policy in force over a secondary guarantee period.

- 1. General.
 - a. Policies with a secondary guarantee include:
 - A policy with a guarantee that the policy will remain in force at the original schedule of benefits, subject only to the payment of specified premiums;
 - (2) A policy in which the minimum premium at any duration is less than the corresponding one-year valuation premium, calculated using the maximum valuation interest rate and the 1980 CSO valuation tables with or without ten-year select mortality factors, or any other table adopted after January 1, 2000, by the national association of insurance commissioners and promulgated by rule by the commissioner for this purpose; or
 - (3) A policy with any combination of paragraphs 1 and 2.
 - b. A secondary guarantee period is the period for which the policy is guaranteed to remain in force subject only to a secondary guarantee. When a policy contains more than one secondary guarantee, the minimum reserve shall be the greatest of the respective minimum reserves at that valuation date of each unexpired secondary guarantee, ignoring all other secondary guarantees. Secondary guarantees that are unilaterally changed by the insurer after issue shall be considered to have been made at issue. Reserves described in subsections 2 and 3 shall be recalculated from issue to reflect these changes.

- C. Specified premiums mean the premiums specified in the policy, the payment of which guarantees that the policy will remain in force at the original schedule of benefits, but which otherwise would be insufficient to keep the policy in force in the absence of the guarantee if maximum mortality and expense charges and minimum interest credits were made and any applicable surrender charges were assessed.
- d. For purposes of this section, the minimum premium for any policy year is the premium that, when paid into a policy with a zero account value at the beginning of the policy year, produces a zero account value at the end of the policy year. The minimum premium calculation shall use the policy cost factors, including mortality charges, loads, and expense charges, and the interest crediting rate, which are all guaranteed at issue.
- e. The one-year valuation premium means the net one-year premium based upon the original schedule of benefits for a given policy year. The one-year valuation premiums for all policy years are calculated at issue. The select mortality factors defined in subdivisions b, c, and d of subsection 2 of section 45-04-12-03 may not be used to calculate the one-year valuation premiums.
- f. The one-year valuation premium should reflect the frequency of fund processing, as well as the distribution of deaths assumption employed in the calculation of the monthly mortality charges to the fund.
- 2. Basic reserves for the secondary guarantees. Basic reserves for the secondary guarantees shall be the segmented reserves for the secondary guarantee period. In calculating the segments and the segmented reserves, the gross premiums shall be set equal to the specified premiums, if any, or otherwise to the minimum premiums, that keep the policy in force and the segments will be determined according to the contract segmentation method as defined in subsection 2 of section 45-04-12-02.
- 3. Deficiency reserves for the secondary guarantees. Deficiency reserves, if any, for the secondary guarantees shall be calculated for the secondary guarantee period in the same manner as described in subsection 2 of section 45-04-12-04 with gross premiums set equal to the specified premiums, if any, or otherwise to the minimum premiums that keep the policy in force.
- 4. Minimum reserves. The minimum reserves during the secondary guarantee period are the greater of:
 - a. The basic reserves for the secondary guarantee plus the deficiency reserve, if any, for the secondary guarantees; or

b. The minimum reserves required by other rules or rules governing universal life plans.

History: Effective January 1, 2000. General Authority: NDCC 28-32-02 Law Implemented: NDCC 26.1-35

Appendix

SELECT MORTALITY FACTORS

This appendix contains tables of select mortality factors that are the bases to which the respective percentage of subdivision b of subsection 1 of section 45-04-12-03 and subdivisions b and c of subsection 2 of section 45-04-12-03 are applied.

The six tables of select mortality factors contained herein include: (1) male aggregate, (2) male nonsmoker, (3) male smoker, (4) female aggregate, (5) female nonsmoker, and (6) female smoker.

These tables apply to both age last birthday and age nearest birthday mortality tables.

For sex-blended mortality tables, compute select mortality factors in the same proportion as the underlying mortality. For example, for the 1980 CSO-B table, the calculated select mortality factors are eighty percent of the appropriate male table in this appendix, plus twenty percent of the appropriate female table in this appendix.

Appendix

SELECT MORTALITY FACTORS

Age	-	2	w	4	S	- 6	7	8	9	10		12	13	1	15	16	17	-		19
0-15	100	100	100	100	100	100	100	100	100	100	100	100	100	100	8	100	100	_	5	٠,
16	100	100	100	100	100	100	100	100	100	9	100	100	20	100	100	8	8	0	٠١٠	
17	100	100	100	100	100	100	100	100	100	00	100	100	100	00	100	100	8	100		100
8	96	98	98	99	99	100	100	90	92	92	92	92	93	93	96	97	98	98		÷.,
19	82	804	84	87	87	87	79	79	79	00	81	82	82	827	85	06	9	9 7		97
20	69	71	71	74	74	69	69	67	69	70	7	71	7	71	7	79	œ	90		
21	66	86	69	71	66	66	67	66	67	70	70	70	70	71	2	77	82	800		
22	65	66	66	63	63	64	2	64	65	68		83	68	69	71	77	200	26		
23	62	63	59	60	62	62	63	63	2	65	,	67	67	69	70	76	00	20 0		9
24	60	56	56	59	59	60	61	61	61	2	6	64	66	67	70	76	82	02		94
25	52	53	55	56	58	58	60	60	60	63		63	64	67	69	75	00	88		94
26	2	52	55	56	58	58	57	61	61	62	63	64	66	69	66	73	80	86	1	93
27	5	52	55	57	50	60	61	61	60	63		64	67	66	67	74	80	87		93
28	49	5	56	Un Qu	60	60	61	62	62	63	64	66	65	66	68	74	82	87		9.4
29	49	5	56	58	60	61	62	62	62	64		62	66	67	70	76	87	88		
2	49	50	56	58	60	60	62	63	63	64	62	63	67	68	71	77	83	88		94
1	47	50	56	58	60	62	63	64	64	62	63	66	89	70	72	78	83	89		t6
32	46	49	56	59	60	62	63	66	62	63	66	67	70	72	73	78	00 40	89		95
i ii	å	49	56	59	62	63	64	62	65	66		70	72	73	75	80	85	90		95
4	42	47	56	60	62	63	51	63	66	67	70	71	73	75	76	<u>00</u>	88	90		95
35	40	47	56	60	63	61	62	65	67	68	7	73	74	76	76	81	88	90		95
36	38	42	56	60	59	61	63	65	67	68	70	72	7.1	76	77	82	86	91		95
37	38	45	- 56	57	61	62	63	65	67	660	70	72	74	76	76	81	86	90		95
38	37	44	53	58	61	62	65	66	67	69	69	73	75	76	77	00	800	91		95
39	37	4	53	58	62	63	65	65	66	68	69	72	74	76	76	00	86	90		9,
8	س	40	53	58	62	63	65	5	2	82	83	71	7,	7,	11	0	0	2		

70	69	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	400	47	46	45	44	43	42	4	Age
48	23	23	22	22	22	22	22	23	23	23	23	24	24	25	25	27	27	28	28	30	30	32	32	31	34	u A	4	34	34	
52	52	32	30	30	30	30	30	30	30	30	30	<u>د</u> ي	ين	32	32	33	35	35	37	38	40	4	42	43	45	44	43	43	41	2
									39						37					1 40					1					w
60	60	60	60	45	45	45	45	44	43	43	43	43	43	43	43	44	44	45	46	47	49	52	53	56	58	58	59	58	58	4
60	60									48									Ì.										1	5
65	65		65		1			Ŋ.	49	100	٠.,				50					53						60				6
70	70	70	70	70	70	75	52	15	50	50	51	50	51	51	53	53	53	52	Ž.	54	S	57	57	. 59	60	2	63	63	65	7
70	70	70	70	70	70	75	75	52	52	52	53	53	5	51	55	55	55	56	56	56	56	\$7	58	59	60	60	62	63	64	00
70	70	70	70	70	70	75	75	75	53	53	55	56	56	56	57	57	57	57	57	57	57	57	59	59	59	61	62	63	2	9
70	70	70	70	70	70	75	75	75	75	57	50	59	59	61	61	61	6	61	61	61	61	5	60	60	60	62	64	64	66	10
100	100	100	100	100	100	100	100	100	100	100	63	2	66	67	68	67	67	66	66	66	66	65	65	63	63	64	66	66	68	=
100	100	100	100	100	100	100	100	100	100	100	100	67	69	70	72	72	71	71	71	71	69	68	68	67	66	67	67	69	70	12
100	100	100	100	100	100	100	100	100	100	100	100	100	72	73	7.1	71	7.1	72	72	72	72	72	71	71	71	71	72	72	7.4	ü
100	100	100	100	100	100	100	100	100	100	100	100	100	100	7.4	75	75	75	74	73	73	73	73	7.1	74	74	7.4	74	75	76	Ξ
100	100	100	100	100	100	100	100	100	100	100	100	100	3	100	78	76	76	75	75	75	7	74	75	75	77	77	77	77	77	Į,
100	100	100	100	100	100	100	100	100	100	100	100	100	190	100	100	œ 11	82	80	80	80	79	79	80	80	82	82	00 22	82	82	16
100	100	100	100	100	100	100	100	100	100	100	100	100	9	100	100	100	86	9	85	85	20	Ç0	85	85	86	86	86	86	86	17
110	100	100	100	100	100	100	100	100	100	100	100	100	8	100	100	100	100	90	90	90	90	90	90	90	91	91	91	91	91	81
100	100	100	100	: -					- 1	100															95	95	95	95	95	19
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	90	100	100	20+

Age		2	C)	4	Un	6	7	œ	9 D	10	olior	Duration 10 11	ation 11 12		12	12 13	12 13	12 13 14 15	11 12 13 14 15
71	48	52	55	60	60	65	70	70	70	70	100	100	100	100	100	100		8	
72	48	52	55	60	80	65	70	70	70	70	100	100	100	100	100	100		00	100 100
73	48	52	55	60	60	65	70	70	70	70	100	100	100	100	100	100		8	
74	48	52	55	60	8	65	70	70	70	70	100	100	100	100	100	100	book	8	
75	48	52	55	60	60	65	70	70	70	70	100	100	100	100	100	100	-	8	
76	8	52	SS	60	60	65	70	70	70	100	100	100	100	100	100	100	=	0	100
77	48	52	Un Un	60	60	65	70	70	100	100	100	100	100	100	100	100	10	-	
78	8	52	SS	60	60	65	70	100	100	100	100	100	100	100	100	100	101	٠.	
79	48	52	Si	60	60	65	100	100	100	100	100	100	100	100	100	100	100	_	
80	48	52	55	60	60	100	100	100	100	100	100	100	100	100	100	100	100		
2	48	52	55	60	100	100	100	100	100	100	100	100	100	100	100	100	5	-	
82	8	52	55	100	100	100	100	100	100	100	100	100	100	100	100	100	100	_	
83	<u>6</u>	52	100	100	100	100	100	100	100	100	100	100	100	100	100	100	10	•	
84	4	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	10	-	
85+	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	-	-	

27 28 29 23 23 22 22 10 18 17 16 63 63 63 63 63 100 98 86 60 58 56 61 62 S 2 2 2 3 3 6 6 6 5 3 5 4 5 3 5 5 5 64 68 68 6 6 6 6 Ö 9 9 Ē

Male, Non-Smoker

70	69	86	67	66	65	2	2	62	16	60	59	58	57	56	55	54	53	52	25	50	49	48	47	46	45	44	5	42	4	Age
48	50	00	111 00	18	18	00	19	19	20	20	22	22	23	23	24	25	25	27	27	29	29	30	30	32	32	32	32	34	34) Inter-
52	52	24	24	24	24	24	25	25	26	26	26	28	28	29	29	30	31	34	33	37	39	40	40	42	44	44	43	43	4	2
55	55	55	32	32	32	32	33	32	3	33	E.	33	35	35	35	36	37	39	40	42	43	46	48	50	52	52	53	53	53	Ç.
60	60	60	60	36	36	36	36	38	37	37	37	37	38	38	38	39	41	42	43	45	400	49	52	54	57	57	58	58	58	4
60	60	60	60	60	39	39	40	40	4	4	4	41	42	42	42	43	£	#	45	47	50	2	54	56	59	59	60	60	61	2
65	65	65	65	65	65	40	40	40	40	40	41	41	42	42	43	44	45	45	47	48	51	52	55	57	60	60	61	61	61	6
70	70	70	70	70	70	75	4	41	4	41	42	43	43	4	45	47	47	48	48	49	50	53	55	57	59	60	60	62	62	7
70	70	70	70	70	70	75	75	42	42	42	4	45	45	47	48	48	49	49	50	50	51	53	51	56	57	59	60	61	62	00
70	70	70	70	70	70	75	. 75	75	42	42	44	45	47	48	49	49	50	50	5	51	53	1.5	54	55	57	59	60	61	63	9
70	70	70	70	70	70	75	75	75	75	45	46	4	49	50	50	<u>Si</u>	51	53	53	12	Š	55	Si	56	57	58	60	63	65	10
100	100	100	100	100	100	100	100	100	100	100	50	<u>v</u>	53	55	56	55	56	56	57	57	57	57	59	59	59	60	62	1.0	65	-
100	100	100	100	100	100	100	100	100	100	100	100	53	S	57	58	59	59	60	60	61	61	61	61	61	61	62	64	66	67	12
100	100	100	100	100	100	100	100	100	100	100	100	100	86	58	59	59	61	60	61	61	61	62	62	63	63	65	66	67	69	13
100	100	100	100	100	100	100	100	100	100	100	100	100	100	59	19	61	61	62	61	61	62	63	63	65	66	67	86	69	71	14
10.5	100	100	100	100	100	9	8	100	100	100	100	100	8	100	62	62	62	62	62	61	62	63	66	67	86	69	69	71	71	15
									100																					16
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	77	77	77	77	77	78	80	80	00	8	00	83	83	17
100	001	100	100	100	100	100	100	100	9	100	3	100	001	100	100	100	100	00	85	00	8051	00 00	86	87	87	00	00	00	88	81
100	100	100	100	100	100	100	100	100	00	5	100	100	100	100	100	100	100	100	92	92	92	93	93	93	94	94	94	94	10	19
100	100	100	00	100	100	100	100	100	100	100	100	3	200	100	100	100	00	100	100	100	100	100	100	100	100	100	100	100	100	20+

Issue									Du Du	Duration	OKET									
Age	-	2	w	4	C/n	6	7	00	9	10	=	12	13	14	15	16	17	8	19	20+
71	400	52	55	60	60	65	70	70	70	70	00	100	100	100	100	100	8	100	8	108
72	400	52	55	60	8	65	70	70	70	70	00	100	100	8	3	90	100	100	100	100
73	48	52	55	6	60	65	70	70	70	70	100	100	100	3	100	100	100	100	190	100
74	48	52	55	8	8	65	70	70	70	70	100	100	100	3	8	100	100	100	8	100
75	48	52	55	60	60	83	70	70	70	70	100	100	100	100	100	100	J00	100	100	100
76	400	52	55	6	80	65	70	70	70	100	100	100	100	100	100	100	100	8	100	100
77	48	52	55	60	60	65	70	70	100	100	100	100	100	100	9	100	100	100	8	100
78	48	52	55	60	60	65	70	100	100	100	100	100	100	100	100	100	100	100	100	100
79	48	52	55	60	60	65	100	100	100	100	100	100	100	100	100	100	100	100	100	90
80	48	52	55	60	60	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
81	48	52	SS	60	100	100	100	100	100	100	100	100	8	100	100	100	100	100	100	100
82	400	52	55	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
S ₂	4	52	100	100	100	100	100	100	100	100	100	100	100	100	100	180	100	100	100	100
22	400	100	100	100	8	100	100	100	100	100	100	100	100	100	100	100	100	100	3	100
85+	8	8	3	g	3	100	Ŝ,		3	5		100	100	5	3	3	ŝ	3	5	1

21 28 71 29 30 68 31 68 31 63 32 63 33 60 34 57 35 53 36 57 37 49 38 48														er Ngje		-			17	-	19 100			16 100	0-15 100	Age 1	Issue
48 55 45 50													3 75		111		0 92						0 100	0 100	001	2	
65		66	70	71	73	74	74	77	77	78	78	79	78	79	79	82	85	96	99	100	100	100	100	100	100	نيا	
	70	70	71	75	77	77	78	78	œ		00		82		grafia.		000		100		4	100	100	100	100	4	
	72	72	74	74	79	79	79	79	79	81	00	20	82	82	81	22	000	90	95	100	100	180	100	100	100	Ŋ	
								00			82		14	83				93			100	100	100	100	100	6	
	74	74	75	75	75	75	00	00	82	82	82	23	æ	83	83	88	89	93	96	100	100	100	90	100	100	7	
	74	75	76	76	76	76	76	00	 60	801	00	00	82	82	82	86	89	92	95	99	100	100	100	100	100	00	
	75	76	77	77	77	77	77	76	<u>\$2</u>	38	<u>∞</u>	<u>∞</u>	82	83	83	86	90	93	96	99	00	100	100	100	100	9	Male
1	77	78	78	79	79	79	77	77	76	80	<u></u>	82	00	84	85	88	90	95	97	99	100	100	100	100	100	10	Male, Smoker Duration
					e je			77										95	. 7			100	100	100	100	Seein Seein	n n
		20		81				80			77			84		86	90	93	96	99	100	100	100	100	100	12	
	001	83	<u>00</u>	83	84	ස	83	83	81	80	80	80	90	84	90	86	89	93	96	99	100	100	100	100	100	13	
	86	00 U1	98	85	86	85	85	83	00	80	80	80	80	85	85	88	90	92	96	99	100	100	100	100	100	14	
0	86	87	86	87	88	87	85	80	83	81	00	00	00	81	86	89	92	93	96	100	100	100	100	100	100	15	
		3 -						88		177					: ¹ 1,					100				11	100	16	
								91		200					ŲŽ.			96	1						100	17	
								94								96	97	97	98	100	100	100	100	100	100	18	
								97							17				8		100	100	100	100	100	19	
								100		4.11					1					1				100	100	20+	

70	69	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	Age
48	27	25	25	24	24	24	24	25	25	25	26	26	28	28	29	30	30	32	32	<u>د</u>	34	35	36	37	37	39	39	40	40	-
52	52	36	35	35	34	4	ć. Li	33	CJ CJ	33	33	33	35	35	35	36	37	40	42	43	45	46	47	48	50	50	50	49	49	2
SS	55	55	45	45	45	45	45	43	4	43	43	43	42	42	42	43	44	46	47	49	51	53	55	58	60	60	62	62	63	w
60	60	60	60	53	52	51	51	50	49	48	48	48	47	47	47	48	49	50	52	53	56	58	61	63	66	66	67	. 68	68	4
60	60	60	63	60	57	57	56	56	55	54	54	54	53	53	53	53	54	54	55	55	58	66	63	65	68	68	69	70	71	C/h
65	65	65	65	65	65	57	56	56	55	53	53	54	54	55	55	55	56	56	57	57	59	62	64	67	68	69	69	71	72	6
70	70	70	70	70	70	75	59	58	57	56	57	56	57	57	59	59	59	60	60	60	16	63	64	66	68	68	70	71	72	7
70	70	70	70	70	70	75	75	61	59	58	59	59	60	60	16	61	61	19	61	61	62	63	64	66	67	69	70	71	72	80
70	70	70	70	70	70	75	75	75	63	62	63	63	64	63	65	65	65	63	63	63	63	65	65	66	67	69	70	71	73	9
70	70	70	70	70	70	75	75	75	75	66	66	67	67	68	67	67	67	67	67	67	67	67	67	67	67	69	71	73	75	10
Ţ	7 - 3	100							100																:_					post post
100	100	100	100	100	100	100	100	100	100	100	100	78	78	79	80	80	79	78	78	78	77	75	75	7.4	73	74	76	76	78	12
100	100	100	100	100	100	100	100	100	100	100	100	100	80	83	1.00	90	83	00	80	80	80	79	79	78	78	79	79	00	81	:3
100	100	100	100	100	100	100	100	100	100	100	100	100	100	85	86	85	85	8	83	8	81	81	81	81	00	00	83	003	28	14
100	100	100	100	100	100	100	. 100	100	100	100	100	100	100	100	90	89	87	000	90	81	83	83	90	00	00	80	00 U1	85	85	15
100									100			7.																88		16
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	92	91	90	89	90	90	90	90	91	91	91	91	91	17
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	9.4	9.4	92	93	93	94	10	9.1	94	9.4	9.1	94	18
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	97	96	97	97	97	97	97	97	97	97	97	19
				. :					100										- 1					' .						20+

Issue									Male	Male, Smoker Duration	n (er									
Age	-	2	3	4	Un	6	7	cc	9	10	=	12	13	14	55	16	17	18	19	20+
71	48	52	55	60	60	65	70	70	70	70	100	100	100	100	100	100	100	100	100	
72	48	52	55	60	60	65	70	70	70	70	100	100	100	100	100	100	100	100	100	
73	48	52	55	60	60	65	70	70	70	70	100	100	100	100	9	100	100	100	100	
74	48	52	55	60	60	65	70	70	70	70	100	100	100	100	100	100	100	100	100	
75	48	52	55	60	60	65	70	70	70	70	100	100	100	100	100	100	100	100	100	
76	48	52	55	60	60	65	70	70	70	100	100	100	100	100	100	100	100	100	100	- 1
77	48	52	55	60	60	65	70	70	100	100	100	100	100	100	100	100	100	100	100	
78	48	52	55	60	60	65	70	100	100	8	100	100	100	100	100	100	100	=	100	
79	48	52	55	60	8	65	100	100	100	100	100	100	100	100	100	100	100	100	100	
80	48	52	55	60	8	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
81	48	52	55	S	100	100	100	100	100	100	100	100	100	100	00	100	100	100	100	
82	48	52	55	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
83	48	52	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
200	48	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	110	100	
95+	100	100	100	100	100	100	100	100	3	100	100	100	100	180	100	180	1110	1	100	

Female, Aggregate Duration

40	39	38	37	36	35	ω A	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	56	17	16	0-15	Age	anssi
32	34	34	36	36	. 36	36	36	35	35	35	(J)	34	34	34	34	39	42	4	47	48	65	83	99	100	100		
40	40	41	41	40						38										50				100	100	2	
45	45	44	47	45	45	45	44	45	43	43	43	43	4	41	41	42	44	2	50	51	68	00 44	100	100	100	w	
53	53	52	52	53	53	52	52	51	51	50	49	47	47	45	44	44	45	45	51	51	68	90	100	100	100	4	
58	58	57	57	55	59	56	500	56	56	56	51	53	50	49	47	47	47	47	47	51	68	20	100	100	100	U	
	63			- 11						56									4	47			12.	100	100	6	
65	66	66	65	65	65	63	64	63	60	59	550	56	ž	51	50	50	49	48	48	480	63	86	100	100	100	7	
67	68	68	67	67	67	66	65	66	64	63	60	59	57	56	53	51	51	49	49	48	63	78	100	100	100	œ	
68	69	69	68	68	68	67	66	65	67	66	63	62	59	58	56	2	53	53	51	49	64	78	93	100	100	9	שעו
69	69	70	69	70	70	68	67	66	65	67	64	63	60	59	57	56	7	Į,	53	51	66	79	95	100	100	0.1	Duration
	70				1.					70					1.					100				100	100	Ε	
69	70	71	72	7.4	74	7.1	74	72	72	71	70	73	70	69	67	10	64	61	60	57	71	90	97	100	100	12	
70	70	72	73	7.4	75	76	75	75	74	7.4	72	70	73	70	69	66	19	63	61	58	72	85	97	100	100	13	
73	73	74	75	75	76	76	76	76	75	75	71	72	70	73	71	69	67	2	64	61	74	88	100	100	100	14	
										76										63			100	100	100	15	
					1,11					8									71	70	80	90	100	100	100	16	
										86					100					. 7					100	17	
					1. 1.					90					1										100	18	
										95										-:					100	19	
										1										100					100	20+	

70	69	86	67	86	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	4	Age
60	19	19	19	19	19	19	20	20	22	22	22	22	22	22	22	22	23	23	25	25	26	28	28	29	31	31	3	32	32	Smerk
60	64	25	25	25	25	27	28	28	29	30	30	30	29	29	29	29	30	30	32	32	34	35	35	37	38	39	39	40	40	2
64	68	68	30	30	30	32	 	33	143 173	36	36	36	35	35	35	35	36	36	38	38	39	4	41	43	44	45	45	45	45	u
68	72	72	72	35	35	36	38	39	39	41	4	41	4	41	41	4	4	4	41	41	43	44	46	48	49	50	51	52	53	4
68	72	72	72	72	39	40	41	4	42	43	44	44	45	45	47	47	47	45	45	46	47	49	49	51	53	54	55	56	57	5
72	72	72	72	72	72	42	44	45	46	47	48	49	50	51	53	53	51	51	50	50	52	52	Ž.	54	56	58	59	61	63	6
75	75	75	75	75	75	80	46	47	49	50	15	53	54	56	57	57	56	56	55	55	SS	57	57	59	59	61	61	63	64	7
75	75	75	75	75	75	80	80	49	50	51	53	56	56	59	61	61	61	61	61	61	61	61	19	62	62	63	65	65	67	00
80	80	80	80	80	80	80	80	80	52	53	55	57	58	60	61	61	62	62	63	63	63	63	62	63	63	64	65	66	68	9
80	80	80	80	80	80	80	80	80	80	55	56	57	59	61	61	62	63	65	66	67	67	66	66	65	65	86	66	68	68	10
100	100	100	100	100	100	100	100	100	100	100	59	61	61	62	62	62	65	66	68	69	69	68	68	67	67	67	68	69	69	period period
100	00	100	100	100	100	100	100	100	100	100	100	62	62	63	63	66	66	68	69	72	71	71	69	69	86	68	69	68	69	12
100	100	100	100	100	100	100	100	100	100	100	100	100	<u></u>	64	64	66	68	68	71	72	72	72	71	71	71	71	69	70	69	13
100	100	100	100	100	100	100	100	100	100	100	100	100	100	67	68	69	72	73	74	75	75	75	77	77	77	75	7.1	7.	73	T
	100	100	100	100	100	100	100	100	100	100	100	100	3	100	69	70	72	73	7.4	71	75	77	77	78	79	78	77	75	74	15
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	76	78	78	79	79	80	82	82	82	<u>83</u>	507	80	80	79	16
100	00	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	œ	00	8-1-	100	80	86	86	87	87	87	86	85	œ 4	17
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	5	100	100	89	90	90	90	91	91	91	92	91	91	90	90	18
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	95	95	95	95	95	96	96	96	95	95	95	19
5	100	100	100	100	100	100	100	100	100	100	100	=	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	20+

									5	The State of										
Age	-	2	ىن	4	5	6	7	200	9	10	11	12	13	14	22	16	17	56	19	10+
7	- 60					72	75	75	80	80	100	100	100	100	100	100	100	100	100	-
72	- 60					72	75	75	80	80	100	100	100	100	100	100	98	100	100	=
73	- 60					72	75	75	80	80	100	100	100	100	100	100	100	100	100	=
74	66					72	75	75	80	80	100	100	100	100	100	100	8	100	100	= ;
75	60					72	75	75	80	80	100	100	100	200	100	100	2	3	100	_
76	60					72	75	75	80	100	100	100	100	100	100	100	00	100	100	=
77	60					72	75	75	100	100	100	100	100	6	<u>100</u>	100	00	100	100	=
78	- 60					72	75	100	100	100	100	100	100	100	100	100	100	100	100	
79	96					72	100	100	100	100	100	100	100	100	100	100	100	100	100	_
80	60	60) 64	68	68	100	100	100	100	100	100	100	100	100	100	100	100	100	100	101
201	- 6					100	100	100	100	100	100	100	100	100	100	<u>=</u>	8	100	100	=
82	- 60					100	100	100	100	100	100	100	100	8	100	100	100	100	100	=
83	60					100	100	100	100	100	100	100	100	100	100	100	100	100	100	Des .
00	6			100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	198	=
85+	10		0 20	100	90	100	100	B	200	100	3			3		ŝ	100	5	3	5

Female, Aggregate
Duration

Age	-	2	<u>سا</u>	4	, UI	6	7	00	9 10	10	=	12	1 1	jament .	13 1	13 14 1	13 14 15 1	13 14 15 16 1	13 14 15 16 17 1	13 14 15 16 17 18 1
0-15	100	100	100	100	100	100	100	100	100	100	100	_	100		100	100 100	100 100 100	100 100 100 100	100 100 100 100 100	100 100 100 100 100 100
16	100	100	100	100	100	-	100	100	100	100	100	10	9	00 100		100	100 100 1	100 100 100	100 100 100 100	100 100 100 100 100
17	96	98	98	98	98		99	99	92	92	93		95		95	95 97	95 97 99	95 97 99 99	95 97 99 99 99	95 97 99 99 99 100
50	78	80	80	80	80		00	74	75	75	78		79		82	82 83	82 83 85	82 83 85 88	82 83 85 88 91	82 83 85 88 91 94
19	60	62	63	63	63		59	59	60	60	64		67		67	67 70	67 70 72	67 70 72 78	67 70 72 78 83	67 70 72 78 83 89
20	42	44	45	45	45		42	42	451	45	50	19.00	51		53	53 56	53 56 58	53 56 58 66	53 56 58 66 75	53 56 58 66 75 83
21	41	42	44	45	4		42	44	47	47	15		53		54	54 57	54 57 59	54 57 59 67	54 57 59 67 75	54 57 59 67 75 84
22	39	41	44	4	4		4	45	49	49	15			56	56 57	56 57 58	56 57 58 60	56 57 58 60 68	56 57 58 60 68 76	56 57 58 60 68 76 84
23	38	41	38	40	4		44	46	49	50	56			57	57 58	57 58 60	57 58 60 62	57 58 60 62 70	57 58 60 62 70 77	57 58 60 62 70 77 85
24	36	36	38	40	- Line		46	47	50	51	58		59		60	60 62	60 62 63	60 62 63 70	60 62 63 70 78	60 62 63 70 78 85
25	32	34	37	40	in in	1,2	46	49	51	53	59		60		62	62 63	62 63 64	62 63 64 71	62 63 64 71 78	62 63 64 71 78 86
26	32	34	37	41	رن		47	50	53	53	60		62		63	63 64	63 64 62	63 64 62 70	63 64 62 70 77	63 64 62 70 77 85
27	32	34	38	43	46		49	15	53	S	62		2		64	64 62	64 62 62	64 62 62 70	64 62 62 70 77	64 62 62 70 77 85
28	30	34	39	43	47		51	53	56	58	63		63		61	61 62	61 62 63	61 62 63 70	61 62 63 70 78	61 62 63 70 78 85
29	30	35	40	45	50		52	58	58	59	64		61		62	62 63	62 63 63	62 63 63 70	62 63 63 70 78	62 63 63 70 78 85
30	31	35	40	46	51		53	56	59	60	62	100	62		63	63 65	63 65 65	63 65 65 72	63 65 65 72 79	63 65 65 72 79 86
143	L.	35	40	46	51		55	58	60	55	62		62		63	63 65	63 65 65	63 65 65 72	63 65 65 72 79	63 65 65 72 79 86
32	32	35	40	45	5		56	59	57	58	62		83		63	63 65	63 65 64	63 65 64 71	63 65 64 71 78	63 65 64 71 78 86
33	32	36	4	47	52		58	55	58	59	63		63		65	65 65	65 65 65	65 65 65 72	65 65 65 72 79	65 65 65 72 79 86
4	121	36	41	47	52		55	57	58	59	63		65	••••	10	64 65	64 65 64	64 65 64 71	64 65 64 71 78	64 65 64 71 78 86
35	33	36	41	47	52		57	58	59	61	63		6-4		64	64 64	64 64 64	64 64 64 71	64 64 64 71 78	64 64 64 71 78 86
36	33	36	4	47	49	53	57	55	59	61	63	1	64			63 64	63 64 63	63 64 63 70	63 64 63 70 78	63 64 63 70 78 85
37	32	36	41	44	49		57	58	59	60	62		62		61	61 62	61 62 63	61 62 63 70	61 62 63 70 78	61 62 63 70 78 85
38	32	37	39	45	50		57	58	60	60	61		61	61 61	61	61 62	61 62 61	61 62 61 69	61 62 61 69 77	61 62 61 69 77 84
39	30	35	39	45	50		57	58	60	59	60		60		59	59 60	59 60 61	59 60 61 69	59 60 61 69 77	59 60 61 69 77 84
40	28	32	9	45	50		56	57	59	65	60		50		59	59 59	59 59 60	59 59 60 68	59 59 60 68 76	59 59 60 68 76 84

Female, Non-Smoker Duration

69	68		67	66	65	64	63	62	6	60	59	58	57	56	55	Ľħ	53	52	51	50	49	48	47	46	45	44	43	42	4	Age	Issue
	ت	ü	15	15	15	4	16	16	17	17	7	17	00	3	500	18	19	20	21	21	23	23	24	24	26	26	27	27	28	-	
2	64	8	19	19	19	21	20	22	22	23	23	23	23	23	23	24	24	25	26	27	29	30	30	32	33	34	<u>د</u> 4	35	35	2	
	68	68	22	23	23	24	24	25	25	26	26	26	28	28	28	29	29	30	30	32	33	35	35	37	38	38	39	39	39	w	
ò	72	72	72	25	25	27	28	28	29	30	30	2	31	32	32	32	32	<u>در</u> در	34	34	35	37	39	40	42	42	4	44	45	4	
9	72	72	72	72	28	29	30	30	32	32	u	ين	35	36	37	37	37	37	37	37	39	40	42	43	45	47	47	49	49	S	
3	72	72	72	72	72	30	32	32	ين دن	<u>ب</u>	35	36	38	39	41	=	41	41	41	41	42	44	45	47	48	50	50	52	52	6	
1	75	75	75	75	75	80	i Li	34	35	36	38	34	<u>-</u>	42	43	43	43	+	4	44	45	47	47	49	51	52	53	54	55	7	
1	75	75	75	75	75	. 80	80	35	36	38	39	41	13	=	45	45	47	47	48	48	48	49	49	51	51	53	53	55	55	00	
9	80	80	80	80	80	80	80	80	38	39	40	41	‡	4	45	47	48	48	49	50	50	50	5	52	52	54	55	56	58	9	Duration
00	8	88	80	80	80	80	80	80	80	40	=	42	1	L.	ti	47	480	50	5	53	2	53	53	53	53	55	55	57	57	10	Duration
	=	100	100	100	100	100	100	100	100	100	±	ţ,	45	46	16	47	19	50	53	54	51	51	51	51	Ž.	55	56	57	58	11	
	100	100	100	100	100	100	100	100	100	100	100	4	45	46	45	-19	49	51	53	55	55	SS	55	55	55	55	57	57	59	12	
	=	100	100	100	100	100	100	100	100	100	100	100	46	46	17	49	51	51	54	- 55	55	55	56	56	56	56	56	58	58	13	
	130	100	100	100	100	100	100	100	100	100	100	100	100	49	50	51	52	55	55	56	57	59	59	60	61	61	60	60	59	I	
	100	00	100	100	100	100	100	100	100	100	100	100	100	100	50	21	512	53	55	55	56	57	8	61	62	62	6	6	60	15	
	5	100	100	100	100	100	100	100	100	100	100	100	100	100	100	16	62	62	64	64	65	66	68	69	70	70	69	69	68	16	
	100	100	100	100	100	100	100	100	100	100	100	3	100	100	100	100	71	72	73	73	7.	7.1	76	77	77	77	77	77	76	17	
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	81	82	82	802	83	00	84	005	005	00	90	oc C	18	
		- 6	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	91	91	9	9	92	92	92	92	92	92	92	19	
										100																				20+	

,				11					<u></u>		4			-	-		-
	85+	82	83	82	81	80	79	78	77	76	75	74	73	72	71	Age	ssue
	100	60	60	60	60	8	60	60	60	60	60	60	60	60	60		
	100	100	60	60	60	60	68	60	60	60	66	60	60	60	60	2	
	100	100	100	64	64	64	64	64	64	64	64	64	2	64	64	3	
	100	100	100	100	68	68	68	<u>6</u>	68	68	68	68	68	68	68	4	Ž.
	100	100	100	100	100	68	68	68	68	68	68	5.00	68	26	68	th.	
	100	100	100	100	100	100	72	72	72	72	72	72	72	72	72	6	
	100	100	100	100	100	100	100	75	75	75	75	75	75	75	75	7	
	100	100	100	100	100	100	100	100	75	75	75	75	75	75	75	90	
	100	100	100	100	100	100	100	100	100	80	80	80	80	80	80	9	Duration
	100	100	100	100	100	100	100	100	100	100	80	80	80	80	80	10	1011
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	=	
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	12	
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	13	
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	4	
	100	100	100	100	100	100	100	100	100	100	00	3	100	100	100	15	
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	16	
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	17	
	100	100	100	100	100	100	100	100	100	100	100	100	100	8	100	100	
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	19	
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	20+	

Female, Non-Smoker Duration

22 23 24 25 89 9 9 100 92 80 78 77 64 64 - 53 100 100 100 92 92 70 69 70 69 70 70 70 71 71 8 3 8 4 4 8 8 8 8 8 8 8 8 8 8 8 8 Duration 2 92 100 100 92 93 88 88 9 9 9 9 9 9 20+ 1000 10

Female, Smoker

70	69	68	67	66	65	64	3	70	61	60	59	500	57	56	55	54	53	52	5	50	49	400	47	46	45	44	4	42	41	Age
60	24	24	24	24	24	25	25	26	26	28	28	28	26	26	26	28	28	29	30	31	CH CH	34	34	36	37	39	39	40	40	-
8	64	32	<u>ي</u> 12	32	32	33	(J	33	35	36	36	36	35	35	35	36	37	38	39	41	42	44	44	46	47	48	49	49	50	2
64	68	68	39	39	39	40	41	4	42	43	43	43	42	42	42	43	43	45	45	46	48	50	5	53	55	55	55	57	57	u
68	72	72	72	44	44	45	46	47	400	49	49	49	49	49	49	49	49	50	51	15	53	54	57	59	61	62	. 63	65	65	4
68	72	72	72	72	49	50	51	51	52	53	54	Si	55	56	57	57	57	56	56	57	58	60	62	63	65	67	69	69	71	C)
72	72	72	72	72	72	53	55	55	56	57	57	59	61	62	63	63	62	62	61	61	63	64	66	68	70	71	73	74	76	6
75	75	75	75	75	75	80	57	58	59	61	63	63	66	67	69	69	68	68	67	67	68	69	70	71	73	75	76	77	79	7
75	75	75	75	75	75	80	80	62	63	64	67	68	69	71	73	73	73	74	74	74	74	7.4	75	75	76	78	78	80	81	00
80	80	80	80	80	80	80	80	80	99	67	68	69	72	72	73	74	74	75	75	77	77	77	77	77	78	80	80	82	83	9
200	80	80	80	80	80	80	80	80	80	69	70	72	73	7.1	74	75	77	79	80	81	81	80	80	79	80	80	82	83	20	10
5	100	100	100	100	100	100	100	100	100	100	76	76	76	76	76	78	79	80	83	85	<u>ç</u>	00	83	83	00	82	00 Lu	20	805	jumps promit
100	100	100	100	100	100	100	100	100	100	100	100	78	78	78	78	80	81	83	85	87	86	86	85	85	00	1.8	00	00 Us	86	12
100	100	100	100	100	100	100	100	100	100	100	100	100	79	79	79	81	83	84	85	87	87	87	86	86	86	86	85	86	805	13
100	100	100	100	100	100	100	100	100	100	100	100	100	100	85	86	87	89	90	90	91	92	92	93	93	94	93	92	90	89	I
	100	100	00	100	100	100	100	100	100	100	100	100	100	100	87	89	89	90	90	90	91	92	94	96	97	96	93	92	90	15
100	5	100	00	100	100	100	100	100	100	100	100	100	100	100	100	91	91	92	92	92	93	94	95	97	98	97	94	1.6	92	16
100	9	100	200	100	100	100	100	100	100	100	100	100	100	100	100	100	93	9.4	10	9.4	95	95	96	98	98	98	96	95	1.6	17
100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	96	96	96	96	97	98	98	99	98	97	97	9,6	œ
	200	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	98	98	98	98	99	99	99	99	99	98	98	19
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	9	100	9	100	100	100	100	100	100	100	100	100	100	20+

									יי	Duration										
Age	-	2	3	4	S.	6	7	œ	9	10	=	12	13	14	15	16	17	- T	19	20+
71	60			89	68	72	75	75	80	80	100	100	100	100	8	100	100	100	100	100
72	60			89	68	72	75	75	80	80	100	100	100	100	100	100	100	100	100	100
73	60			68	68	72	75	75	80	80	100	100	100	8	8	100	100	100	100	100
74	60			68	68	72	75	75	80	80	100	100	90	8	100	100	100	100	100	100
75	60			68	68	72	75	75	80	80	100	100	100	100	100	100	100	100	100	100
76	60			68	68	72	3	75	80	100	100	100	100	100	00	100	100	100	100	100
77	60			68	68	72	75	75	100	100	100	100	100	100	100	100	100	100	100	100
700	60			68	68	72	75	100	100	100	100	100	100	00	100	100	100	100	100	100
79	60			89	68	72	100	100	100	100	100	100	100	100	100	100	100	100	100	001
80	60	60	64	68	68	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
00	60			68	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
82	60			100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
83	60			100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
œ.	6(100	100	100	00	100	100	3	100	100	100	100	100	100	100	100	20	100
85+	101			100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Female, Smoker
Duration